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ABSTRACT

This guide examines the computer's role in the educational environment of students with emotional or behavioral disorders (EBD). The computer's power to reinforce students who are reluctant learners, in a personalized learning environment without the complications of adult interactions or behavioral control issues, is noted. Characteristics of EBD students are described. Software capabilities important for EBD students are outlined, such as providing step-by-step instruction; offering feedback, correction, and reteaching without emphasizing failure; and focusing attention through animation, color, graphics, sound, and interesting interactions. Applications for students with behavioral problems are discussed, including using the computer for contingency management, providing opportunities for cooperative learning, developing social/leisure-time skills, and using the computer to monitor behavior. Applications for students displaying emotional problems are then reviewed, including analyzing learning styles, facilitating personal expression, improving self-esteem, and training in stress reduction. Finally, applications for students with behavioral control problems are examined, including training in impulse control, providing practice in problem solving, and involving the student in simulations. A list of 18 references, 14 addresses for software products, and 6 curriculum references is included. (JDD)

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Center for Special Education Technology

Tech Use Guide

Using Computer Technology

ED389155

Using the Computer with Students with Emotional and Behavioral Disorders

It can be argued that the computer is the most powerful reinforcer in the educational environment for a majority of students with emotional or behavioral disorders. For those students who are reluctant learners due to motivational problems or cognitive deficits—as well as for those students who have emotionally-based difficulties—the computer offers a personalized learning environment without the complications of adult interactions or behavioral control issues. Software can be creatively adapted to support instruction in thinking, problem solving, social interaction, and behavioral control skills. The computer provides an essential tool to monitor behavioral change and to produce reinforcing materials and activities.

Characteristics of EBD Students

The student with emotional or behavioral disorders (EBD) is defined as an individual with behavioral or emotional responses in school that "are so different from his/her generally accepted, age-appropriate, ethnic or cultural norms as to result in significant impairment in self-care, social relationships, educational progress, classroom behavior, or work adjustment" (Forness & Knitzer, 1990). This new term has been proposed by The National Mental Health and Special Education Coalition to replace the current definition of serious emotional disturbance (SED) prescribed in the Education of the Handicapped Act, P. L. 94–142.

The applications discussed in this Tech Use Guide are directed to this inclusive group of students. Their emotional or behavioral disorders may occur as a separate disorder or in combination with other handicapping conditions. These students may display acting out, noncompliant behaviors, low motivation, interpersonal difficulties, low self-esteem, withdrawal from others, anxieties and fears, inattention and impulsivity, poor problem-solving abilities; and insufficient self-control. This guide does not address the needs of autistic children and youth. Most autistic children are multiply handicapped and severely cognitively impaired; their needs go beyond the scope of this guide.

Although students with emotional or behavioral disorders benefit from the same instructional computer applications used with students with learning disabilities—such as direct instruction, effective drill-and-practice, use of tool programs, and written expression—the computer has many unique contributions for this population. These contributions may be viewed as the "behavior change curriculum" to assist students dealing with *behavioral problems*, *emotional problems*, and *cognitive-based behavioral deficits*. The content of this guide addresses these three areas. It is based to a large extent on promising practices reported by teachers as little empirical support exists in the literature at this time. Future research efforts are needed to explore the relative contribution of technology within an otherwise effective educational program.

Software Capabilities Important for EBD Students

Well designed software models what a good teacher does! It provides step-by-step instruction; offers feedback, correction, and reteaching without emphasizing failure; and focuses attention through animation, color, graphics, sound, and interesting interactions. Teachers should evaluate software for capabilities that compensate for learning difficulties of EBD students—difficulties that frequently interfere with academic instruction and adjustment.

- Endlessly patient software can allow students to work at their own pace, wait for responses, provide immediate reinforcement, respond with neutral corrective feedback, and ignore irrelevant student behaviors.
- Computer activities should actively involve the student so that the student learns by doing. As the student evaluates alternatives, makes choices, and responds to consequences, relationships between actions and consequences are clarified.
- When students have difficulty, programs should branch unobtrusively to remedial material. Additional instruction/practice can occur without the student first having to fail, accompanied by his or her negative feelings toward self and learning. For EBD students with histories of failure, successful

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learning experiences markedly affect behavior in class and acceptance of assignments.

- Recordkeeping is important to track performance and to visually display progress. By tracking their own task performance, students can learn responsibility for their own learning while practicing skills of self-assessment, self-monitoring, and self-reinforcement.

Applications for Students Displaying Behavioral Problems

Using the Computer for Contingency Management

The most prevalent use of computers in EBD programs is to provide reinforcement for appropriate behavior. The use of computers as reinforcers is appropriate, but this practice must *not* be the primary use of computers in the instructional environment. Contingency use of computers should never replace the student's access to the computer for individualized instruction.

Computer time earned on a contingency basis offers an attractive "lure" to increase students' motivation to control their behavior. When given a choice of free-time activities, girls as well as boys are equally likely to select computer activities; this preference is not related to previous exposure to time on the computer. Computer reinforcement used on a contingency basis improves both time spent on-task and work productivity for EBD students diagnosed with attention deficits or conduct disorders (Fick, Fitzgerald, and Milich, 1984).

A prevalent misuse of computer time as a reinforcer appears when teachers use computer time as a "filler" and allow students to engage freely in computer activities for fun and entertainment (Rieth, Bahr, Polsgrove, Okolo, & Eckert, 1987). When used for the purpose of contingent reinforcement, computer time needs to be *earned* with clear relationships between behavior and consequences. Teachers can effectively award points or "computer bucks" to be traded in for computer time. The free time on computers can be provided when it is convenient during the school day, but not when it displaces appropriate computer-based instruction.

Suggestions for Implementation

1. Align instructional goals with computer activities. Use the computer as reinforcement during free time—*not* during instruction.
2. Allot reinforcement on a time/ratio basis; the amount is earned by meeting criteria for behavioral or academic goals.
3. Offer a variety of computer software for free-time use. Although most students select arcade-type games, once introduced, higher level adventure games, problem- solving programs, and creative software have equally high appeal.
4. Use an aide or volunteer to supervise computer free time. In addition to supervision, aides can assist students in learning new programs or improving skills. Aides assume a high status, share important skills, and model appropriate interaction with computers and strategies for problem-solving. College students or high-school peer counselors who readily share the excitement of the computer culture with EBD students are excellent aides.

Providing Opportunities for Cooperative Learning

In the cooperative learning approach to instruction, students are placed in dyads or small groups and are asked to work together to reach a common goal. In large classrooms, students are frequently assigned to work together on computer activities because of logistical reasons. Observations of these computer learning groups indicate that students can learn equally well, share the computer and materials, encourage each other, and increase involvement of reluctant participants. For a summary, see *Tech Use Guide: Computers and Cooperative Learning* (Council for Exceptional Children, 1990).

Given the power of the computer as a teaching tool and the effectiveness of the cooperative learning approach, teachers of EBD students have new potential in designing effective CAI activities to facilitate desired behavior change in students. In a study where the behavior of severe conduct-disordered adolescents was compared when working in dyads on matched computer–noncomputer activities, dramatic differences were observed. On the computer-based activities, the overall level of positive, on-task behavior was significantly higher and peer interactions were more positive; the level of nonattentive, off-task behavior was significantly lower, and the observed levels of negative interactions and disruptiveness favored the computer condition (Fitzgerald, 1987).

There are a number of factors that hypothetically relate to improved behavioral functioning of students when working on cooperative, computer-based activities. The first is motivation. EBD students will do almost any task when presented on a computer. Second, students respond to the "polished" product made by the computer and are willing to continue their efforts. Third, computers offer partial control and structure to the task. Most software programs present one piece of the task at a time, require steps to be carried out in sequence, limit decision making to one variable at a time, and provide feedback, reinforcement, or pleasing graphics to maintain interest in the users.

Software for cooperative group activities needs to be learner-centered. This implies that students use the program to meet their needs—making choices from available options, problem solving, or creating products. Other than drill-and-practice software, most programs can be adapted for cooperative usage. Students can use tool programs to create class projects; story writing,

graphics, music, or game construction software is useful for expression; problem solving, adventure game, and simulations provide experiences in organizational and thinking skills; and interactive videodiscs can set the scene for realistic problem solving or discussions.

Cooperative learning procedures need to be adapted to successfully incorporate the computer and the various levels of interpersonal difficulties that typically arise with EBD students. Teachers may need to provide more structure and advance organization to the cooperative learning activity for EBD students.

Suggestions for Implementation

Group Size. Because of interpersonal difficulties, the dyad is initially the preferred group size. Students are more likely to interact humanely, to negotiate with each other regarding decisions, and to share control of the computer. Skills learned and practiced within a dyad can be generalized to a three-person group, which is considerably more complicated in terms of group dynamics. When the cooperative activity involves larger teams of students, Dickson & Vereen (1983) suggest that roles be assigned and rotated across all group members.

Group Formation. Although research strongly supports the use of heterogeneous ability groupings (Schubert, 1985), consideration should be given to existing peer relationships with EBD students. Interactions are more difficult when: a) dominating students are combined with passive or withdrawn peers, and b) great animosity or conflict exists between students in a group. One successful strategy is to mix dyads across activities, so that different partners work on different projects or parts of an overall class project. This reduces competition between dyads, increases opportunities for social skill practice, and facilitates ownership by the entire class group.

Role of the teacher. Groups of EBD students may be unable, on their own, to problem solve and manage their own difficulties. Teachers can assist by prestructuring activities and directly teaching necessary social and interaction skills. The central behavior management system in place in the classroom needs to be maintained during the cooperative activity period. Teachers need to intervene in conflict situations before they escalate.

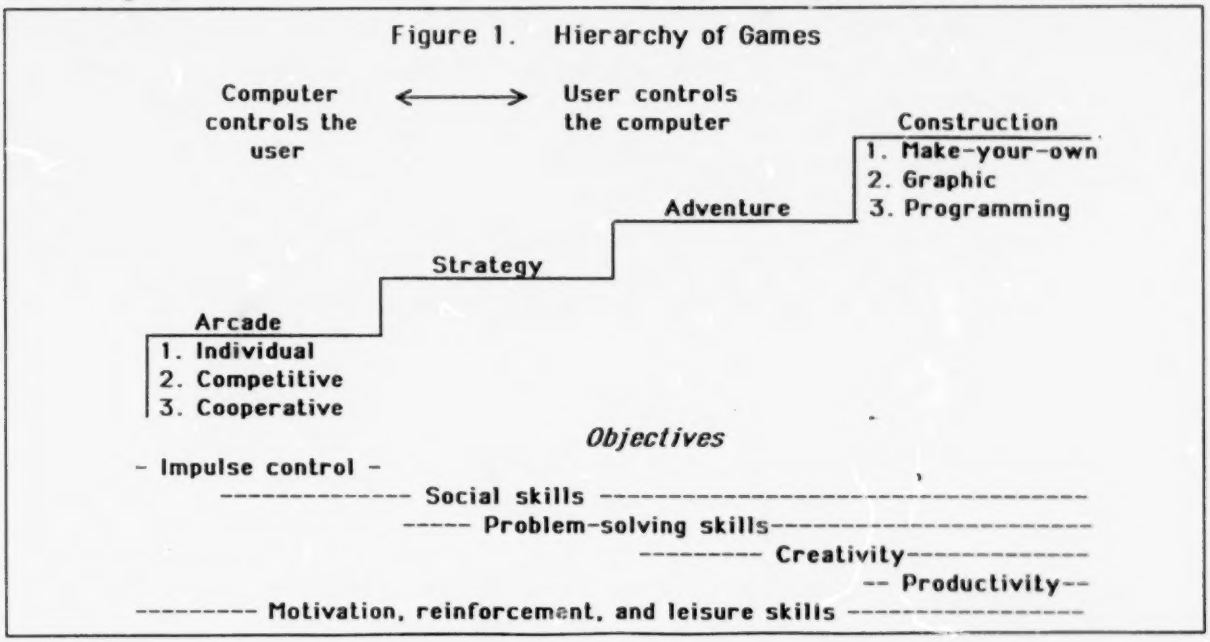
Direct teaching of cooperative learning/ social skills. In addition to the general rules for cooperative groups, more specific social skills for group members need to be taught. This instruction can be integrated into social skills instruction in the classroom prior to generalization to the cooperative activity. Additional structure will help students apply these skills; behaviors can be listed on point cards and problems and solutions can be discussed during postgroup processing.

Developing Social-Leisure Time Skills

Games can have a central place in the curriculum for EBD students when they are carefully selected and structured. Game activities provide opportunities for social interaction, intellectual stimulation, and development of good work habits. Games are motivating to students because they include fantasy, provide challenge, and stimulate curiosity (Malone, 1981). By successful game playing, students who normally cannot compete socially are able to gain respect from their peers and improve their self-esteem.

Educators have severely maligned the playing of computer games in classrooms, viewing them at best as mere entertainment or at worst as destructive of the moral fiber of disaffected youth. Undoubtedly, these attitudes are related in part to the violent theme of many games. In game selection, the teacher should avoid games that fixate on competitive, aggressive, and destructive themes and

Figure 1. Hierarchy of Games



games where students practice rapid shoot-em-up responding as the "best" solution for handling problems rather than cooperation or analyzing alternative strategies (Goles, 1983). Games create natural situations to practice impulse control and problem-solving skills that can be generalized for use in personal situations (Fick et al., 1984).

The first step in integrating game activities into the behavior change curriculum is to specify the instructional objectives for the student. Games have been used to:

1. Reinforce appropriate learning and behavior on a contingency basis.
2. Practice self-control skills that require inhibition of impulses.
3. Develop leisure education skills to increase social acceptance.
4. Practice social interaction skills.
5. Practice self-control skills that require thinking and problem-solving skills.
6. Provide opportunities for the student to be creative and productive.

Figure 1 illustrates four basic categories of games that differ in the amount of control the user has in directing the game activity. Lower-level game software is extremely structured and competitive, allowing the user little control over the game other than rapid, reflexive responding. Higher-level game software is more flexible, imaginative, and open to user control to create games or graphic products.

This hierarchial arrangement can be used to guide appropriate game choices to meet behavioral objectives in the curriculum. Beginning with the natural interest of students in arcade-level games, the teacher can move the students up the hierarchy to more advanced and creative computer uses.

A computer club can be an effective way to increase social mainstreaming in a school. The activities are popular, involve high levels of interaction, and can be easily structured for a range of abilities, ages and interests. Being good at computer games is highly valued in the youth culture and increases one's social desirability and acceptance.

Suggestions for Implementation

1. Use games as a safe and motivating environment to practice cognitive-behavioral control skills. When identical self-instructional cues are used in social problem-solving and game situations, students are more likely to develop automaticity in using the skills and in generalizing them to new situations.
2. Provide direct instruction on a variety of games and construction programs to expand the student's repertoire of skills and interests for leisure time pursuits. Involve regular education peers in leisure uses of the computer.

Application Highlight

A computer club was developed as an Eagle scout project. It involved community boy scouts interacting with middle school-aged EBD students in inpatient or outpatient treatment programs at a psychiatric facility. The focus was on learning new recreational software programs and practicing game-playing strategies. An Eagle scout selected games and construction software to fit the game hierarchy. The scout leader recruited and trained age-appropriate scouts from the community to model effective game-playing skills and interpersonal behaviors. The cognitive training cues of "Stop"..."Think"..."Act"..."Results" were woven into game-playing sessions. Each scout served as a peer model and game coach for two EBD students. Results showed that EBD students learned effective gaming skills, could transfer these skills to similar games, and shifted free-time choices from lower-level arcade games to higher-level games and construction software (Fitzgerald & Saeugling, 1989).

Using the Computer to Monitor Behavior

Computer utility tools offer an effective means for implementing a behaviorally-based classroom program (Edyburn, 1990). Specific behaviors, daily records, progress graphs, and motivational display materials need to be constructed and maintained for each student. The benefits of computerized recordkeeping and analysis are evident. Records are easily updated, can be combined with graphs or reinforcers for delivery, and printed out in polished form for communicating with parents or school officials.

Computerized recordkeeping and display procedures have important therapeutic benefits for students who participate in these processes. Depending on the complexity of the software program and the level of student independence on computers, students can enter their own data, compile records, and print graphs to display progress. The process of graphing data on personal behaviors facilitates goal-setting and commitment on the student's part. In the program, *Positively Rewarding*, students enter their own points into an individualized account and see a graph of their progress. Also, these points trigger the delivery of reinforcers, surprise screens, and an award based on a lottery.

Materials that students can create on the computer and print out are reinforcing. These include posters, banners, certificates, greeting cards, point cards, contract forms, and cartoons. The creation process itself is motivating, as students take pride in computer-generated productions. Also, these activities involve students in self-monitoring and self-reinforcement—skills that are necessary for generalization and maintenance of new behaviors. This sharing process helps move EBD programs from externalizing control to shared or internalizing control.

Applications for Students Displaying Emotional Problems

Analyzing Learning Styles

A striking observation by teachers of EBD students is that they accept computer-delivered tasks more readily than traditional tasks. Students with attentional difficulties, as well as low-functioning EBD students, appear to attend longer and more consistently to tasks presented on the computer. Why this is so probably differs for each student—it may be due to novelty effects, personal desire to work on the computer, instructional design features helping to control attention, the fact that computer time often must be "earned" and is therefore perceived to be reinforcing, or that many computer programs simply offer more structure and systematic progression in instruction. Because students are likely to do their best when working on the computer, it becomes a powerful diagnostic tool for the teacher.

Attention can be monitored by comparing time-on-task under typical instructional conditions to matched tasks delivered on the computer (Fitzgerald, Fick, & Milich, 1986). Knowledge and skills can be evaluated more accurately when the student is fully attentive and involved in the task. This leads to identifying optimal learning styles for each student.

Authoring programs are available where the teacher can create content, select types and rates of reinforcers, set the number of items in the instructional pool, determine the speed of presentation, set criterion level for advancement or review, or determine alternative input. Authoring programs have provided an important breakthrough by allowing teachers not only to individualize CAI instruction for students, but also to customize instructional design features to determine optimal learning styles. Examples include *Quickflash* and the *Multisensory Authoring Computer System*.

Suggestions for Implementation

1. Implement matched tasks on the computer and in traditional form and observe the student's behavior and achievement under both conditions. Vary instructional design features of the tasks, settings in which the tasks are delivered, reinforcement conditions, and adult involvement to evaluate the optimal learning condition for each student.
2. Teach students to be independent problem solvers. This can be done by teaching a computer-using unit to all students and by providing a computer-using "license" when independent skills are demonstrated. Computer task cards can be provided to guide students through independent loading and operating of software. Students can be taught problem-solving steps by using Socratian dialogue to guide them through "What do I do now?" when confronted with a software problem (Fazio, Polsgrove, & Jamison, 1986).

Facilitating Personal Expression

As educators have shifted to behaviorally-based intervention programs, the use of expressive therapies has declined in use. Teachers are finding, however, that students enjoy creating with the computer, and their products often reveal personal concerns and perceptions. When students write or create on a regular basis, the process becomes more natural and helpful therapeutically to them.

As an easing-in process, some teachers have students write daily in journals. Software programs, such as *Secret Journal*, are available that create a journal format and provide suggested topics and sentence starters for encouraging expression. Many of the commercial writing programs have suggested writing activities that are offered through supplementary disks or formats using the word processor. Teacher prompts can be integrated into the *FrEdWriter* word processing program to guide students' writing. By providing students personal data disks, each student can keep a private journal on disk. These can be locked by special passwords to maintain privacy.

A popular classroom activity is the production of classroom newspapers. Students use a variety of expressive software programs in their production. Newpapers provide an opportunity for personal expression and for cooperative learning activities. Useful software programs for students include: word processing programs for generating articles; desktop publishing programs for formatting articles; and graphic drawing programs or utilities, cartoon-maker programs, and teacher utilities for developing crossword puzzles or word finds for enhancing the newspaper.

Expression and communication can be extended through telecommunication networks. One example is the *Kids.Talk* bulletin board on SpecialNet. Networks provide the means for students to leave messages and correspond electronically with other students at remote sites. Cooperative projects can be carried out despite distance. There is tremendous potential for students to share similar problems, solutions, and support through distance communication.

Older students are intrigued by multimedia programs and enjoy incorporating classroom video and synthesized music into computer-based productions. These advanced applications provide a way for groups of students to study

problems they experience in daily living and to create a "message" to share with others.

Suggestions for Implementation

1. Encourage self-expression through a variety of formats. Allow students to experiment with many programs and encourage creativity. Be flexible in scheduling development time and allow students to help each other.
2. Do not use these expressive products for instruction in writing, punctuation, grammar, or spelling. When products are meant to be shared, utilize an editing process after creation that is based on standards for communication. Allow students to withdraw or revise their material before public display or publishing.
3. Encourage personal expression across the curriculum. As students become comfortable expressing their ideas through print and media, they will become more open in sharing their thoughts and participating in solutions. Use these expressions to better understand student viewpoints and follow up with personal conferences for concerns.

Improving Self-Esteem

It is commonly recognized that students are proud of computer-generated products because they can be revised until error-free. Products that are polished do not reflect student failures or handicaps. People are impressed with what the student is able to produce, thereby increasing his or her status with others. The product then interacts with the person and the process to improve the student's self-esteem. This observation is not unique to EBD students. However, the importance of providing concrete experiences that improve self-concept are critical with the EBD population.

Students can receive instruction in tool programs for performing assignments for mainstream classes, for transition work experiences, and for relating with potential employers and outside agencies. Tool programs can help students with projects such as graphic design, computer-aided geometry, music, data-based information, graphs, and survey design and analysis. Students can use simple authoring shell programs to create interesting materials to support regular education activities. Examples include puzzle programs, such as *Spell Press* and *Multiple Choices*, and instructional games, such as *Tic Tac Show* and *Game Show*.

The class can "take on" a production project as a service to the school or to a community group. Some examples of service projects undertaken by special education students include creating greeting cards or school logo materials with *Print Shop*, authoring simple instructional materials for teachers, and helping younger children write and produce their own stories. More advanced students could operate a school lab and assist peers in writing and producing computer-generated materials.

Suggestions for Implementation

1. Consider using the computer as the mode for all final student assignments. Use examples from the real world as models for finished products. Be sure that the student is satisfied with the final product and receives due credit from others.
2. Preteach necessary skills to students prior to application. Develop generic problem- solving guides to help students use instructional tool programs.
3. Make it easier for EBD students to become peer tutors to others (including teachers and parents) in using computer tool programs.

Training in Stress Reduction

Biofeedback programs can be used in stress reduction training programs. The biofeedback process is used to monitor the student's use of cognitive and muscular relaxation techniques to change states within the body. One low-end software program, *Learning to Cope with Pressure*, works with a sensor attached to the computer. By measuring the galvanic skin resistance, it demonstrates how cognitive restructuring techniques can induce muscle relaxation. More expensive electronic equipment is needed to gain reliable measures. Biofeedback training procedures can be incorporated within a cognitive retraining program for adolescents. In curriculums such as *Thinking, Changing, Rearranging* and *Clear Thinking*, students learn to alter their feelings and behaviors by changing their thought habits.

Applications for Students With Behavioral Control Problems

Increasingly, educators and mental health professionals have become aware that behavior problems in students can be the result of deficits in thinking, self-control, and social skills. Self-control deficits are apparent in impulsive youngsters who act quickly with the first response that comes to mind without thinking through a situation or selecting a different choice of action.

Cognitive-behavior training approaches must include the steps of didactic instruction, opportunity to practice the skills in "safe" activities, corrective feedback on use of skills, and assistance in generalizing these skills for daily personal use. Computer activities can be integrated into this instructional sequence in ways that are difficult to do through traditional methods.

Training in Impulse Control

Students with impulse control problems are quick to react in stressful situations; they fail to stop and think prior to acting. This frequently leads to disruptive behavior, which in turn becomes the behavior of concern rather than the problem of impulsivity itself. Curricular programs, such as *Think Aloud* and *I Can Behave*, attempt to teach reflective thinking skills and self-control through self-instructional training, modeling, and role rehearsal. Using the computer, teachers have found that

these impulse control skills can be coached and practiced using commercial software.

Arcade games easily lend themselves to impulse control training. Most involve shooting and capturing moves. To be successful in these games, both motor and cognitive control must be exercised in three steps: inhibiting action, planning ahead, and activating at the right moment. As games are played, critical moments can be identified where freezing the game and thinking would be helpful. Instruction needs to be structured in specific, sequential steps with self-instructional cues taught. Indications are that such training transfers to other motor behavior tasks. However, without generalization training for social problem solving, no transfer has been shown for socially impulsive behaviors (Fick et al., 1984).

Suggestions for Implementation

1. Select software that can be interrupted. Have students freeze the game when a problem is foreseen to allow time to make a plan. When the game is reactivated, no points are lost and the student can apply a successful game strategy.
2. Use simple self-instructional cues to guide behavior. One suggested sequence is the STAR program: "Stop"..."Think"..."Act"..."Results." Have students verbalize these cues while engaging in computer activities. When these cues become automatic, they can fade to covert use (Morris, 1980).
3. Use a behavioral counseling approach to help students make a specific plan for using the STAR commands in problematic social situations. Successful use of STAR must be reinforced to be maintained.

Providing Practice in Problem Solving

A central deficit seen in many EBD students is cognitive disorganization in analyzing and solving social and academic problems. This is evident when observing their difficulties in generating alternative solutions to problems, their failure to consider multiple viewpoints, their inability to track means-ends chains, their lack of consequating behaviors, their irrational beliefs, and their inaccurate perceptions of reasonable demands on them (Kendall & Braswell, 1985).

Cognitive-behavioral training curriculums typically include instruction in the problem-solving process. The steps are often incorporated into a self-instructional dialogue format to guide the student's cognitions as well as his or her actions. Most programs for teaching EBD students problem-solving skills include the following:

1. Stop and think. (The impulse control step)
2. What's my problem? (The problem identification step)
3. How can I solve this problem? (Alternative thinking step)
4. What's the best way? (Evaluating alternative solutions)
5. What's my plan? (Making a commitment to a specific plan)
6. Try it out. (Activating the plan and following the plan)
7. How did it work? (The evaluation, self-reinforcement, and redesign step)

Problem-solving software can be found for all ages with varying degrees of complexity. Programs such as *Gertrude's Puzzles* isolate one critical thinking skill, such as memory or sequencing or finding a secret code. Other programs, such as *Mystery at Pinecrest Manor*, offer full scenarios with multiple levels of hidden information and possible solutions. With recent ease of programming videodiscs with multimedia authoring programs, problem-solving scenarios can be created by teachers that present problem-solving situations within a multimedia format.

Although these programs have been developed to provide practice in critical thinking skills, their primary application for EBD students is to serve as the mechanism for practicing the problem-solving process. Therefore, a generic approach is needed for teaching the problem-solving approach, and then for consistently applying it to a wide range of interactive programs.

In *Solutions Unlimited*, computer software lessons are provided to accompany short video programs. Each focuses on problem-solving skills and strategies as applied to such areas as time management, written communication, energy conservation, judging information, and survival in a wilderness situation. This program has been used with EBD students to practice mneumonic cues for self-control when applied to problem situations depicted in the videos as well as in the classroom. The mneumonic cues were utilized as an integral part of the classroom management system (Thursby & Adkins, 1989).

Suggestions for Implementation

1. Preteach the steps of problem solving before applying the process to interactive programs. If students are expected to develop their own strategies and solutions to problems, sufficient structure must be provided to ensure that they practice the correct steps in the correct order.
2. Utilize as wide a variety of software programs as possible for practice in problem-solving skills.
3. Incorporate the following successful teaching practices when training in problem solving: self-instructional cues, steps followed in a dialogue format, teacher modeling of the skills, role rehearsal in applying the skills to social situations, specific plans for implementing problem-solving approaches to personal problem situations, self-monitoring for following the plan, and self-reinforcement for success.

Involving the Student in Simulations

It is particularly difficult to provide generalization experiences for practicing behavior skills outside of the school setting. Yet, it is in the other 17-hour, real-world

day where most EBD students have confrontations that result in serious consequences.

Interactive, computer-based programs can provide students opportunities to practice handling problem situations. Simulation materials are used with topics that are difficult to exploit in real time. In a simulation, the student assumes a particular role, reacts to challenges or problems, and deals with the consequences. Computerized simulations can provide these learning experiences effectively, as the scenario can be rerun, alternatives can be implemented and evaluated, and the student can experiment with new behaviors.

Structuring is also necessary when using computer simulation programs. Most simulation programs do not help students use a problem-solving approach; users are expected to explore the materials, develop their own strategies, and keep track of their actions and consequences. EBD students are not good incidental learners: unless guidance and structure is provided, they will treat a simulation as a game to be played with outcomes determined merely by chance, ill luck, or misunderstandings.

There are many excellent simulation software programs available. Although programs such as *Oregon Trail, Odell Lake*, and *Where in the World is Carmen Sandiego?* are designed for other content areas, they can be used for practicing problem-solving skills. In addition, there are simulation programs with social or personal problem themes. With the program *Drug Alert!* students gather information from a database about drugs and implications in order to help a friend with drug dependency. Similar problem-solving simulation programs are *Choices, Choices* and *The Smoking Decision.*

In the computer simulation program *Limit*, students attempt to drive a car home after attending a party. A number of personal choices are offered at the party, including food consumption, time of eating, type of alcohol or beverage, amount of alcohol consumed, and its frequency. The student enters his or her personal weight, and a graph is shown on the screen displaying the amount of alcohol in the blood related to time and legal limits. Although some students treat this program as a "game," teachers have found that it sensitizes students about the effect of different choices on blood-alcohol levels. Further, it provides a private way for students to investigate their previous actions.

Recently published curriculae have combined video simulations with computerized lessons to teach social skills. In *Social Skills on the Job: A Transition to the Workplace for Students with Special Needs*, a videotape presents vignettes of problem situations for students to analyze and discuss alternative resolutions of the problem. Drill-and-practice software is included so that students can practice making choices and analyzing outcomes. Some of the skills included are greeting authority figures, deciding when to ask for help, and accepting criticism from an employer (Macro Systems, 1989). The *Social Skills on the Job: Career and Social Skills Training (CAST)* curriculum offers a series of career-related videos and accompanying drill-and-practice software for remediation of social skills. This program teaches social skills needed in a variety of vocational settings, such as taking responsibility, apologizing, and handling negative feedback. A computer-managed software program assesses, assigns, and delivers the social skills remediation process.

Application Highlight

Interactive videodisc activities were used successfully with middle school-aged students with emotional disabilities (disturbed) to integrate classroom instruction with therapy sessions. Students controlled a videodisc player by using the Hypercard stack, *LTC LectureMate*, and explored the videodisc version of the film, *Breakfast Club*. The task was to identify scenarios which depicted the following sequence:

Trigger ⟶ Reaction ⟶ Consequences
Behavior

Students had been dealing with this concept of causal-consequential thinking in therapy sessions and were having difficulty understanding and transferring it to their lives. By searching for the behavioral chains in scenes acted on film with teenagers they could readily identify with, they came to understand triggers and consequences which accompany behaviors. The teachers reported that the students were extremely positive about this learning experience, focused during discussions, and transferred their learning to therapy sessions and observed interactions (H. Copel, personal communication, September, 1990).

Suggestions for Implementation

1. Utilize simulation materials that the students can relate to. This improves the likelihood of generalization. Set the simulation within a problem-solving framework and preteach the skills of problem solving. Utilize the situations in group discussions and role play situations when practicing alternative behaviors in classroom groups or counseling sessions.
2. Provide sufficient structure to the task so students can investigate choices and outcomes. Off-line materials may be necessary to sequence the tasks and to provide a means of recording actions and outcomes.

As students demonstrate success, reduce the degree of structure to shift problem solving responsibility to the students.

3. Utilize multimedia authoring programs to create materials to "fit" your local setting and students. Films in videodisc format can be run by teachers as well as by students to explore situations from many perspectives. Easy-to-use authoring programs for the Apple IIGS include *HyperStudio* and *SlideShop*.

Conclusion

Teacher creativity is needed to realize the potential of technology with the emotional and behavioral disorders population. Most existing software products must be adapted from their intended use to meet curricular objectives to support personal change, to facilitate expression and self-understanding, and to practice cognitive-based behavior control skills. Computers have inherent motivational power for these students. Teachers would be well advised to follow the lead of students into the computer and multimedia learning environment.

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Addresses for Software Programs

Choices, Choices—Tom Snyder Productions, 90 Sherman St., Cambridge, MA 02140.

Crossword Magic; Multiple Choices; Drug Alert—Mindscape Inc., 3444 Dundee Rd., Northbrook, IL 60015.

Gertrude's Puzzles—Learning Company, 6493 Kaiser Dr., Fremont, CA 94555.

HyperStudio—Roger Wagner, Publ., 1050 Pioneer Way, Suite P, El Cajon, CA 92020.

Learning to Cope with Pressure; The Smoking Decision—Sunburst Software, One Kendall Square, Cambridge, MA 02139.

Limit—Michael Reberry, 505 NW Logan, Ankeny, IA 50021.

LTC LectureMate, The Learning Technology Center, Peabody College of Vanderbilt University, Box 328 PCVU, Nashville, TN 37203.

MACS—The Johns Hopkins University, Applied Physics Laboratory, Johns Hopkins Rd., Laurel, MD 20707.

Odell Lake; Oregon Trail; Quickflash; Spell Press—MECC, 3490 Lexington Ave. N., St. Paul, MN 55126.

Positively Rewarding—Thomas Software, P.O. Box 937, Saratoga, CA 95071.

Print Shop; Where in the World is Carmen Sandiego?—Broderbund Software, Inc., 17 Paul Dr., San Rafael, CA 94903.

Secret Journal; Slide Shop; Mystery at Pinecrest Manor—Scholastic Software, 730 Broadway, New York, NY 10003.

Solutions Unlimited—Agency for Instructional Technology, Box A, Bloomington, IN 47402-0120.

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